

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )

Preparation for International )  
Telecommunication Union World )  
Radiocommunication Conferences )

IC Docket No. 94-31

REPLY COMMENTS OF  
GE AMERICAN COMMUNICATIONS, INC.

GE American Communications, Inc. ("GE Americom") hereby files its reply comments in the above-captioned matter, to address several matters raised by other parties with respect to the agenda for the 1995 World Radio Conference ("WRC-95"). These concern the interpretation and applicability of Radio Regulation 2613 and whether to allow "reverse band" operations in the C, Ku and Ka-bands by geosynchronous ("GSO") Fixed Satellite Services ("FSS") and non-GSO Mobile Satellite Services ("MSS"). GE Americom would also like to address certain proposals for feeder link spectrum.

The Current Interpretation of RR 2613  
Is Correct and Should be Retained

GE Americom opposes the proposals made by Teledesic Corporation<sup>1</sup> and Loral/Qualcomm Partnership<sup>2</sup> for elimination or overhauling of RR 2613. This regulation serves a useful purpose and should be retained. It is designed to protect GSO satellites from the interference that necessarily will be caused by a non-GSO satellite operating on the same frequencies transiting

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<sup>1</sup> Comments at 4-8.

<sup>2</sup> Comments at 11-12.

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between an earth station and a GSO satellite.<sup>3</sup>

Such interference will occur both on uplink and downlink transmission paths. A non-GSO satellite earth station will send unwanted signals to a GSO satellite whenever a non-GSO satellite transits the line between the transmitting earth station and the GSO satellite. Likewise, a non-GSO transiting the line between a GSO earth station and a GSO satellite will cause harmful interference to the downlink.

Because in each case such interference can be best curbed by non-GSO satellites, it is not unreasonable, if the two services were to share co-primary status in a band, for RR 2613 to require an interfering non-GSO satellite to cease or reduce to a negligible level its transmissions, both on the uplink and downlink frequencies.

In establishing its orbits, using burst transmissions, and in networking among earth stations, a non-GSO satellite has better means at hand in reducing or eliminating uplink interference than a GSO satellite. A non-GSO satellite operator's ability to avoid harmful interference would be facilitated by the fact that it would know when one of its satellites will come between one of its transmitting earth stations and a GSO satellite. A non-GSO uplink station has the

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<sup>3</sup> Because C-band and Ku-band satellites are almost without exception spaced at two-degree intervals throughout the orbital arc that is useful to the U.S., a co-frequency non-GSO satellite that transits between a transmitting earth station and the GSO arc from 69° W.L. to 139° W.L. will almost always interfere with one and/or two U.S. GSO satellites.

ability to avoid harmful interference because it can temporarily suspend transmissions to the non-GSO satellite or can temporarily redirect them to another non-GSO satellite not transiting the line between an uplink station and a GSO satellite. A GSO satellite operator lacks this flexibility.

With respect to downlink interference, the operator of a non-GSO satellite can adjust the footprint of any satellite to avoid interference into GSO-satellite downlinks.

Therefore, in circumstances where one or the other satellite has to yield in a co-primary situation, the onus of reducing or eliminating harmful interference should be upon the non-GSO satellite, which alone has the ability to control such interference. For this reason, RR 2613 should be maintained.<sup>4</sup>

**WRC-95 Should Not Discuss  
Reverse Band Operations on GSO Frequencies**

For the foregoing and other reasons, GE Americom expressed doubt in its opening comments whether GSO and non-GSO Mobile Satellite Service ("MSS") operations could be sufficiently coordinated as to operate on the same frequency. Ellipsat Corporation,<sup>5</sup> Loral/Qualcomm,<sup>6</sup> and Motorola<sup>7</sup> believe that harmful interference could be avoided by "reverse band"

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<sup>4</sup> Of course, interfering situations would never arise if separate allocations are established for non-GSO satellites, including feeder links.

<sup>5</sup> Comments at 6-7, Exhibit A.

<sup>6</sup> Comments at

<sup>7</sup> Comments at 14.

techniques. This describes a frequency plan where a non-GSO satellite would uplink in a GSO satellite downlink frequency and downlink in a GSO satellite uplink frequency.

Yet the documents affiliated with those relied upon by proponents of reverse band techniques recommend that, in a reverse band environment, the minimum distance between earth stations for a GSO satellite and a non-GSO satellite, calculated under conservative assumptions that are proper in interference situations, would be 100 to 200 KM (60 to 120 miles) apart.<sup>8</sup> Coordination is already difficult enough today for earth stations for GSO satellites on shared frequencies, such as C-band, and tolerances may be reduced further still if GSO satellites and terrestrial systems are to share the Ka-band. Adding earth stations for non-GSO satellites sharing the frequencies, even using reverse band techniques, would cause the possibilities for harmful interference to multiply.

While the use of site shielding would reduce the minimum distances between earth stations for GSO and non-GSO satellites in this situation, the risk of harmful interference would continue where one or the other earth station is a mobile one (such as satellite news gathering). In addition, at Ku-band,

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<sup>8</sup> ITU Document 4-5/39-E (May 26, 1994). The calculations used in determining the 100 KM minimum distances failed to take into account the effects of rain, which is particularly damaging to Ku-band transmissions and can further worsen interference because of scattering. Since earth stations located in a rain cell may want to raise their power levels, the corresponding change in interference that would be produced should have been calculated to determine minimum distances.

VSAT's and small direct-to-home antennas would be extremely vulnerable to interference from co-frequency reverse band transmissions.

Accordingly, GE Americom believes that reverse-banding is not an acceptable solution in a real-world environment. Moreover, even with reverse-band techniques, the problems of avoiding harmful interference between FSS and MSS satellites are daunting. The solution of these by a world conference, where sound engineering principles are only one factor undertaken in the process, should not be forced upon the U.S. At the very minimum, the Commission should determine for itself, based on a plenary record, that reverse-band techniques are feasible before placing this on an agenda of an international conference.

**Motorola's Proposal for Feeder Link  
Spectrum is Arbitrary and Should be Rejected**

Motorola Satellite Communications's proposal for WRC-95 feeder link spectrum would not leave any room for FSS downlink transmissions. Motorola begins with the proposition that "certain FSS allocations would be designated for preferred use by GSO networks; certain FSS allocations would be designated for preferred use by non-GSO feeder links; and certain FSS allocations would be designated to have co-equal status between GSO and non-GSO feeder links."<sup>9</sup>

Yet Motorola's application of this proposition fails to set

apart any allocations whatsoever for "preferred use by GSO operations." Moreover, Motorola further constrains FSS use of this band by removing 800 MHz from the 17.7 - 19.7 GHz band currently shared between FSS and terrestrial operations, while designating another 500 MHz of this spectrum for shared use with non-GSO feeder links.<sup>10</sup> As we understand it, the Motorola proposal leave FSS only 400 MHz of spectrum between 17.7 and 18.4 GHz to share with terrestrial operations and a non-contiguous 500 MHz between 19.2 and 19.7 GHz to share with non GSO-feeder links. Correspondingly, non-GSO feeder links would obtain an exclusive allocation of 800 MHz. The Commission should not advance such an inequitable restructuring of the FSS bands before WRC-95 without considering the adverse implications to FSS operations that would use this band to FSS downlink wideband services.

#### Conclusion

In summary, GE Americom believes that, without any demonstrated compatibility between systems, RR 2613 should remain unchanged and that, if at all possible, separate allocations at WRC-95 should be adopted specifically for non-GSO use, including feeder links. The frequency bands suggested by Motorola for feeder links, such as those in the 4635-4669 and 4660-4685 MHz bands,<sup>11</sup> for example, would be appropriate for MSS satellite feeder links, since operations on these will not affect current FSS operations. On the other hand, as suggested by Hughes Space

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<sup>10</sup> Id. at 16.

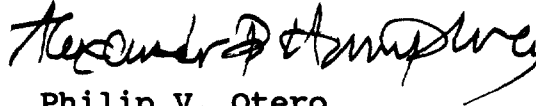
<sup>11</sup> Comments at 14.

and Communications Company/Hughes Communications Galaxy,<sup>12</sup> the U.S. should support the FSS allocation within the 13.75-14.0 GHz band, which would increase the utility of the U.S. orbital arc to satellite customers.

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<sup>12</sup> Comments at 3.

Respectfully submitted,

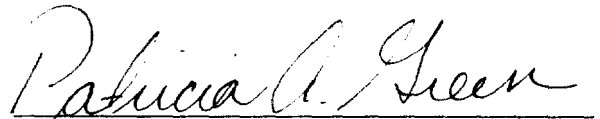
A handwritten signature in black ink, appearing to read "Alexander P. Humphrey". The signature is fluid and cursive, with a long horizontal stroke at the end.

Philip V. Otero  
Alexander P. Humphrey  
GE AMERICAN COMMUNICATIONS, INC.  
1299 Pennsylvania Ave., N.W.  
Washington, D.C. 20004  
(202) 637-4000

August 5, 1994

Certificate of Service

I, Patricia A. Green, hereby certify that copies of the foregoing Reply Comments of GE American Communications, Inc., in IC Docket No. 94-31 were served by first-class mail, postage prepaid, on this 5th day of August, 1994, upon the parties shown on the following Service List.

A handwritten signature in cursive script, reading "Patricia A. Green", written over a horizontal line.

Patricia A. Green

SERVICE LIST

Bruce D. Jacobs  
Glenn S. Richards  
Howard C. Griboff  
Fisher Wayland Cooper Leader  
& Zaragoza L.L.P.  
2001 Pennsylvania Ave., NW  
Suite 400  
Washington, DC 20006

Lon C. Levin  
Vice President  
and Regulatory Counsel  
10802 Park Ridge Boulevard  
American Mobile Satellite Corp.  
Reston, VA 22091

Stephen L. Goodman  
Halprin, Temple & Goodman  
Suite 650 East Tower  
1100 New York Avenue, NW  
Washington, DC 20005

David A. Gross  
AirTouch Communications  
1818 N Street, NW  
Washington, DC 20036

Christopher D. Imlay  
The American Radio  
Relay League, Incorporated  
225 Main Street  
Newington, CT 06111

Booth, Freret & Imlay  
1233 20th Street, NW  
Suite 204  
Washington, DC 20036

Thomas J. Keller  
Verner, Liipfert, Bernhard,.  
McPherson & Hand, Chartered  
901 Fifteenth Street, NW  
Suite 700  
Washington, DC 20005

Ronald J. Krotoszynski, Jr.  
Jonathan D. Blake  
Kurt A. Wimmer  
(Ass'n for Maximum Broadcast Operations)  
Covington & Burling  
1201 Pennsylvania Avenue, NW  
P.O. Box 7566  
Washington, DC 20044

Julian L. Shepard  
Vice President & General Counsel  
Victor Tawil  
Vice President  
Association for Maximum  
Service Television, Inc.  
1776 Massachusetts Ave., NW, Suite 300  
Washington, DC 20036

Howard Monderer  
National Broadcasting Co., Inc.  
1299 Pennsylvania Ave., NW  
11th Floor  
Washington, DC 20004

Robert A. Mazer  
 Nixon, Hargrave, Devans & Doyle  
 One Thomas Circle, NW  
 Suite 800  
 Washington, DC 20005

Jill Abeshouse Stern  
 Shaw, Pittman, Potts  
 and Trowbridge  
 2300 N Street, NW  
 Washington, DC 20037

Gerald Helman  
 Vice President, Policy and  
 International Programs  
 Mobile Communications Holdings, Inc.  
 ELLIPSAT CORPORATION  
 1225 19th Street, NW  
 Suite 480  
 Washington, DC 20036

Gary M. Epstein  
 John P. Janka  
 Mary E. Britton  
 LATHAM & WATKINS  
 1001 Pennsylvania Avenue, NW  
 Washington, DC 20004

James Costantino  
 Executive Director  
 IVHS AMERICA  
 1133 Connecticut Ave., NW  
 Seventh Floor  
 Washington, DC 20036

Robert B. Kelly  
 KELLY, HUNTER, MOW & POVICH, PC  
 Seventh Floor  
 1133 Connecticut Ave., NW  
 Washington, DC 20036

John T. Scott, III  
 William D. Wallace  
 CROWELL & MORING  
 1001 Pennsylvania Avenue, NW  
 Washington, DC 20004

Leslie A. Taylor  
 LESLIE TAYLOR ASSOCIATES  
 6800 Carlynn Court  
 Bethesda, MD 20817

Dr. Stephen Cheston  
 James G. Ennis  
 F. Thomas Tuttle  
 IRIDIUM, INC.  
 1401 H Street, NW  
 Washington, DC 20005

Leonard S. Kolsky  
 Vice President/Director  
 Global Telecommunications Relations  
 MOTOROLA, INC.  
 1350 I Street, NW  
 Suite 400  
 Washington, DC 20005

Philip L. Malet  
 Alfred M. Mamlet  
 STEPTOE & JOHNSON  
 1330 Connecticut Ave., NW  
 Washington, DC 20036

Barry Lambergman  
 FLETCHER, HEALD & HILDRETH  
 1300 North 17th Street  
 11th Floor  
 Rosslyn, VA 22209

John Joseph McVeigh  
 Howard C. Griboff  
 Fisher Wayland Cooper  
 Leader & Zaragoza L.L.P.  
 Suite 400  
 Washington, DC 20006

Albert Halprin  
 Stephen L. Goodman  
 Halprin, Temple & Goodman  
 For Orbital Communications Corp.  
 Suite 650 East Tower  
 1100 New York Avenue, NW  
 Washington, DC 20005

Raul R. Rodriguez  
 Stephen D. Baruch  
 David S. Keir  
 For STARSYS GLOBAL POSITIONING, INC.  
 Leventhal, Senter & Lerman  
 2000 K Street, NW  
 Suite 600  
 Washington, DC 20006

Tom W. Davidson, P.C.  
 AKIN, BUMP, STRAUSS, HAUER & FELD  
 For TELEDISIC CORPORATION  
 1333 New Hampshire Avenue, NW  
 Suite 400  
 Washington, DC 20036

Norman P. Leventhal  
 Raul R. Rodriguez  
 Stephen D. Baruch  
 David S. Keir  
 Leventhal, Senter & Lerman  
 For TRW INC.  
 2000 K Street, N.W.  
 Washington, DC

Leonard Robert Raish  
 For United States Satellite  
 Broadcasting Company, Inc.  
 FLETCHER, HEALD & HILDRETH  
 1300 North 17th Street  
 11th Floor  
 Rosslyn, Virginia 22209

Michael T. Schieber  
 Director  
 DBS Industries, Inc.  
 495 Miller Avenue  
 Mill Valley, CA 94941

George E. Jacobs, P.E.  
 President  
 George E. Jacobs & Associates, Inc.  
 8701 Georgia Ave  
 Suite 410  
 Silver Spring, MD 20910